

APPENDIX O -- PUBLIC AND AGRICULTURAL WATER SUPPLY

CONTENTS

Overall Water Use in the Loxahatchee Basin	1
Public Water Supply Demands	2
Agricultural Water Supply Demands	3
Water Supply Sources	3
Literature Cited	4

List of Tables

Table O-1. Summary of 1999 Allocated Water Uses within the Loxahatchee Watershed.	1
Table O-2. Urban water supply demands (actual water use*) in the Loxahatchee Basin.	2
Table O-3. Summary of Actual vs. Allocated Urban Water Use* in the Loxahatchee Watershed	2
Table O-4. Estimated 1995 Agricultural Water Demands in the Loxahatchee River Basin.	3
Table O-5 Water Supply Demands within the Loxahatchee Watershed	5

Overall Water Use in the Loxahatchee Basin

Water for urban and agricultural uses in the Loxahatchee watershed is supplied from both groundwater and surface water systems. Non-environmental surface water demands within the basin are primarily public water supply, commercial and industrial with some agricultural uses. The commercial and industrial demands vary greatly by type of business. The majority of water used in the basin is for urban and agricultural uses.

Current water resource demands from public water supply, landscape irrigation and agricultural within the basin were estimated based on: (a) the average daily demand values used in the Northern Palm Beach County Comprehensive Water Management Plan for 1995 (SFWMD, 2002) and (b) the annual allocation of each permit holder obtained from the District Water Use permit database from 1998 through 2000. These data are summarized in **Table O-1**. A listing of all Water Supply Permits within the Loxahatchee watershed is provided at the end of this appendix in **Table O-5**. Overall, total allocated urban water demands compiled for 1999 were 32,896 million gallons a year (MGY), which is equivalent to 100,957 acre-feet/year or 90.1 MGD. The largest allocated uses within the watershed were public water supply (18,862 MGY or 51.7 MGD) at 57.3% and agriculture at (6,943 MGY or 19.0 MGD) at 21.1%.

Table O-1. Summary of 1999 Allocated Water Uses within the Loxahatchee Watershed.

Water Use Type	Million Gallon/Year	Acre-Feet/Year	Million Gallon/Day	% of Total
Urban Water Supply	18,862	57,887	51.7	57.3
Agriculture	6,943	21,308	19.0	21.1
Golf Courses	2,705	8,302	7.4	8.2
Industrial	2,619	8,038	7.2	8.0
Landscape	1,767	5,423	4.8	5.3
Total	32,896	100,957	90.1	99.9

Source: SFWMD Water Supply Permit Database, see **Table O-5**.

Public Water Supply Demands

Because public water supply withdrawals are an issue of concern in this watershed, additional analyses were undertaken by the SFWMD to update the information provided in the LECRWSP. Recent monitoring and reporting data were analyzed as well as information provided in applications for permit renewals. Results of this analysis were incorporated into **Chapters 4 and 5** of the Technical Criteria Document. Total public water supply demands for the major utilities within this area were compiled based on actual water use data in SFWMD water use permit records from 1990 through 1999. These data are summarized in **Table O-2**.

Table O-2. Urban water supply demands (actual water use*) in the Loxahatchee Basin.

Year	Seacoast (Hood Road)	Town of Jupiter**	Tequesta**	TOTAL	TOTAL (MGD)
1990	3,412	3,448	351	7,211	19.8
1991	3,198	3,191	397	6,786	18.6
1992	3,238	3,150	536	6,924	19.0
1993	3,536	3,345	665	7,546	20.7
1994	3,480	3,422	497	7,399	20.3
1995	3,536	3,464	513	7,513	20.6
1996	3,673	3,699	549	7,921	21.7
1997	3,995	3,399	428	7,822	21.4
1998	4,604	3,442	589	8,635	23.7
1999	4,129	3,846	581	8,556	23.4
10 year avg.	3,673	3,471	511	7,655	21.0

* Water use in million gallons per year and total water use in million gallons per day (MGD)

** Both the Town of Jupiter and the Village of Tequesta obtain a majority of their water supply from the Floridan Aquifer
Source: SFWMD Unpublished Consumptive Use Permit Data

A ten-year average was computed for this period of record. The 1995-year is comparable with the average for the ten years of record and was used for modeling demands in the Lower East Coast Regional Water Supply Plan (LECRWSP) – (SFWMD 2000). Total 1995 demands were estimated as 7,513 MGY (20.6 MGD) and the ten-year average as 7,655 MGY (21 MGD). The largest users within the watershed consisted of Seacoast Utilities (Hood Rd. Wellfield), Town of Jupiter and the Town of Tequesta. Together these three utilities represent more than 99% of the total urban water supply demand within the watershed.

Table O-3 illustrates the amounts of water that were actually used by the major utilities from 1998 through 2000.

Table O-3. Summary of Actual vs. Allocated Urban Water Use* in the Loxahatchee Watershed

PWS Permittees	Permit Number	1998 Annual Water Use (MGY)	1999 Annual Water Use (MGY)	2000 Annual Water Use (MGY)	1999 Allocations		
					MGY	MGD	Acre- feet/yr
Town of Jupiter	50-00010-W*	3,442	3,846	3,214	10,045	27.5	30,825*
Village of Tequesta	50-00046-W*	589	581	446	1,768	4.8	5,427*
Seacoast Utility- Hood Rd.	50-00365-W	4,604	4,129	4,729	7,049	19.3	21,631
Total		8,635 (23.7 MGD)	8,556 (23.4 MGD)	8,389 (22.9 MGD)	18,862	51.6	57,881

*MGY = Million Gallons/Year; MGD= Million Gallons/Day

*Both the Town of Jupiter and the Village of Tequesta obtain a majority of their water supply from the Floridan Aquifer

The average usage during this period was 23.3 MGD, which represents about 45% of the 51.6 MGD that was allocated for public water supply use. This comparison illustrates the fact that public water supply permittees rarely use the full-allocated amounts and allocated amounts may only be reached during the extreme droughts.

Agricultural Water Supply Demands

Because measured withdrawal data for agricultural uses were not available, these demands were estimated from Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) water demand modeling (Smajstrla 1990, Moraga et al. 1995) and current agricultural acreage (FDEP 1998). Agricultural water use depends on the crops that are grown in the watershed and on how those crops are managed and irrigated. An important factor in accurately estimating agricultural water use is determining the location and acreage of crops. Citrus and small vegetables are the primary agricultural crops found in the basin. The supplemental irrigation requirements for 1995 are found in **Table O-4**.

Table O-4. Estimated 1995 Agricultural Water Demands in the Loxahatchee River Basin.

Subbasin No.	Subbasin Name	1-in-2 Agriculture Demands (ac-ft/yr)	1-in-10 Agriculture Demands (ac-ft/yr)
1	Jonathan Dickinson/ Hobe Sound	3,032	5,123
2	Coastal	558	816
3	The Estuary	643	939
4	C-18/Corbett	6,201	10,478
5	Cypress/PalMar	4,335	7,324
6	The Groves	7,712	13,030
7	Wild & Scenic/Jupiter Farms	792	1,158
	Total	23,273 (20.7 MGD)	38,868 (34.7 MGD)

Sources: Smajstrla 1990, Moraga et al. 1995, FDEP 1998

As shown in **Table O-4**, estimated actual agricultural water use (20.7 MGD) may be slightly higher than the amount allocated in permits (19.0 MGD) shown in **Table O-1**.

Water Supply Sources

Water for urban supply, golf courses, landscape irrigation, and agricultural uses is supplied from three sources within the Loxahatchee watershed: surface water systems, the Surficial Aquifer System (SAS) and the Floridan Aquifer System (FAS). Use of the SAS, the traditional source for public water supply, is limited in most of the watershed due to increased potential for impacts on local wetland systems, the Loxahatchee River, and saltwater intrusion.

In addition, Jupiter/Tequesta is a unique area where the geology does not have a prolific aquifer such as the Biscayne Aquifer. In this area the fine materials, sand and shell within the SAS will not allow large withdrawals. For this reason, this watershed is more concerned with the effects of drought and salt water intrusion during dry periods than other South Florida coastal areas. As a result, several municipalities have chosen (Jupiter and Tequesta) to go to reverse osmosis (RO), utilizing the Floridan aquifer as their primary water supply source.

Use of traditional sources (surface water and the Surficial Aquifer System) for public water supply and landscape irrigation can be expanded for the Loxahatchee watershed with completion of proposed water resource development projects (SFWMD 2000, SFWMD 2002) and more efficient use of regional and local water supplies. However, many of these projects will not be completed within the next five years. Therefore the SFWMD is placing more emphasis on implementation of a comprehensive water conservation program and the use of alternative sources such as the Floridan Aquifer System and reclaimed water to help meet water needs during this period. Some public water utilities and golf courses have supplemented their water demand with the use of the Floridan Aquifer System.

Two of the utilities within the Loxahatchee River Watershed presently use reclaimed water as a supplemental source, minimizing the need to withdraw from the surficial aquifer. Seacoast produces approximately 8 MGD of reclaimed water and returns approximately 6 MGD to the basin and the Loxahatchee River Environmental Control District produces approximately 5 MGD and returns approximately 4.5 MGD to the basin. The use is for landscape and/or golf course irrigation and groundwater recharge. Continued development of such alternative sources, increased emphasis on water conservation, along with some changes to wellfield configurations and operations will help meet future water needs in this area and reduce impacts to the Loxahatchee River and estuary within the next five years.

Literature Cited

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Table O-5 Water Supply Demands within the Loxahatchee Watershed

Martin County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
AGR	SOUTH FLORIDA GRASSING	43-00021-W	N/A	N/A	N/A	289	887
	JENKINS LANDSCAPING	43-00045-W	N/A	N/A	N/A	67	206
	HOBE-ST LUCIE CONSERVANCY DISTRICT	43-00057-W	N/A	3072	5138	4460	13687
	SUNRISE-GULFSTREAM CITRUS GROVES	43-00120-W	N/A	N/A	N/A	545	1673
	SUNSHINE STATE CARNATION	43-00628-W	N/A	N/A	N/A	12	37
	SUN LAND CO	43-00839-W	0	0	0	974	2988
	SOUTH FLORIDA GRASSING INC	43-00893-W	N/A	N/A	N/A	410	1257
Sub Total						6757	20736
GOL	JUPITER HILLS CLUB	43-00054-W ^{wr}	N/A	66	234	58	177
	MARINER SANDS COUNTRY CLUB	43-00064-W ^{wr}	201	586	618	298	914
	CYPRESS LINKS GOLF COURSE	43-00138-W	N/A	N/A	N/A	149	457
	TURTLE CREEK CLUB	43-00140-W ^{wr}	N/A	N/A	?	20	61
	EAGLEWOOD	43-00220-W ^{wr}	56	N/A	N/A	32	98
	JONATHANS LANDING GOLF CLUB, INC.	43-00221-W ^{wr}	104	91	N/A	237	728
	JUPITER ISLAND GOLF COURSE	43-00273-W ^{ll}	92	138	309	16	50
	THE MEDALIST	43-00800-W ^{wr}	?	?	N/A	46	141
Sub Total						855	2625
LAN	LITTLE CLUB CONDOMINIUM ASSOCIATION, INC. THE	43-00202-W	N/A	N/A	N/A	24	75
	LOBLOLLY PINES DEVELOPMENT COMPANY	43-00382-W ^{wr}	N/A	194	184	106	325
	PRESERVE THE	43-00435-W	N/A	N/A	N/A	61	188
	MARINERS SANDS LANDSCAPING	43-00441-W	N/A	3.7	4.9	69	213
	DOUBLE TREE COUNTRY CLUB	43-00632-W	N/A	N/A	N/A	154	473
	JUPITER HILLS HOMEOWNERS ASSOCIATION	43-00722-W	N/A	N/A	64	86	265
	RIVERSIDE MEMORIAL PARK	43-00885-W	N/A	0	N/A	23	70
Sub Total						524	1609

Table O-5. Water Supply Demands within the Loxahatchee Watershed (Cont.)

Palm Beach County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
AGR	PARCEL 19.01	50-00547-W	N/A	N/A	N/A	167	511
	C-18 BASIN PROPERTY/MECCA FARMS	50-01626-W	N/A	N/A	N/A	19	59
Sub Total						186	570
GOL	TEQUESTA COUNTRY CLUB	50-00223-W ^{wr}	N/A	N/A	N/A	9	27
	SEMINOLE GOLF CLUB	50-00349-W	80	72	76	80	245
	PGA NATIONAL	50-00617-W	491	281	857	549	1685
	BALLENISLES CC OF JDM	50-00852-W ^{wr}	413	732	1344	171	524
	EASTPOINTE COUNTRY CLUB INC	50-00941-W ^{wr}	N/A	180	162	60	183
	STONEWAL ESTATES GOLF COURSE	50-01110-W	N/A	N/A	133	114	349
	OLD MARSH GOLF CLUB (UNIT 21)	50-01443-W	130	138	171	128	392
	IRONHORSE LAKE WELLS	50-01906-W	?	?	?	160	492
	INDIAN CREEK GOLF CLUB	50-02053-W ^{wr}	N/A	80	N/A	15	46
	IBIS GOLF & COUNTRY CLUB	50-02120-W	N/A	N/A	N/A	397	1219
	PUBLIC GOLF CORP. CITY OF PALM BEACH GARDENS	50-02319-W	N/A	N/A	N/A	40	123
	GOLF AND RACQUET CLUB AT EASTPOINTE	50-02831-W	N/A	180	162	44	135
	JUPITER DUNES	50-03079-W	N/A	46	N/A	39	119
	THE BEAR'S CLUB	50-04391-W ^{wr}	N/A	N/A	N/A	45	139
Sub Total						1850	5678
IND	WASTEWATER TREATMENT PLANT	50-00126-W	0	1.5	1.3	11	33
	TOWN OF JUPITER RECHARGE SYSTEM	50-01584-W	61	2.1	11	0	0
	PRATT & WHITNEY PUMP ADDITION	50-01663-W	N/A	N/A	2250	2466	7568
	NORTH COUNTY AQUATIC COMPLEX	50-02869-W	N/A	N/A	N/A	38	116
	MOBIL OIL STATION 02-F2W	50-02995-W	N/A	11	9.5	12	36
	TRI GAS INC AIR SEPARATION PLANT	50-03722-W	N/A	37	34	93	285
Sub Total						2619	8038

Table O-5. Water Supply Demands within the Loxahatchee Watershed (Cont.)

Palm Beach County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
LAN	FRENCHMAN'S CREEK GOLF COURSE	50-00091-W	N/A	N/A	N/A	87	267
	JONATHAN'S LANDING	50-00237-W	208	211	285	319	979
	FPL JUNO BEACH OFFICE BUILDING	50-00742-W	N/A	N/A	N/A	15	46
	SEA OATS OF JUNO BEACH	50-01131-W	N/A	N/A	N/A	16	48
	OCEANSIDE TERRACE	50-01204-W	N/A	N/A	N/A	2	6
	RIDGE AT THE BLUFFS, H.O.A.	50-01282-W	88	104	73	52	158
	RIVER THE	50-01373-W	N/A	N/A	N/A	22	66
	JUPITER BAY	50-01391-W	N/A	4.24	N/A	8	26
	VILLAS OF OCEAN DUNES HOA	50-01392-W	N/A	N/A	N/A	18	56
	CRYSTAL POINTE	50-01442-W	N/A	N/A	N/A	14	44
	CROSSWINDS JUPITER SOUTH	50-01484-W	N/A	N/A	N/A	1	4
	SHORES THE	50-01485-W	N/A	N/A	N/A	0	0
	NORTHPOINT CORPORATE PARK	50-01490-W	N/A	N/A	N/A	34	104
	PALM BEACH PARK OF COMMERCE	50-01529-W	N/A	N/A	N/A	110	339
	ADMIRAL'S COVE AND ADMIRAL'S COVE WEST	50-01552-W	N/A	101	N/A	132	405
	INDIAN CREEK	50-01557-W	18	N/A	24	63	193
	PRATT & WHITNEY - IRRIGATION WATER SUPPLY	50-01664-W	N/A	N/A	N/A	38	116
	HAMPTON'S AT MAPLEWOOD THE	50-01702-W	N/A	N/A	N/A	50	152
	MARQUETTE ELECTRONICS	50-01842-W	N/A	N/A	N/A	5	16
	HIGH SCHOOL "GGG"	50-01955-W	N/A	N/A	N/A	30	93
	PALM BEACH MIDDLE SCHOOL A-A	50-02267-W	N/A	N/A	N/A	21	66
	BALLENISLES DEVELOPMENT	50-02370-W	N/A	N/A	118	70	215
	JUPITER PLANTATION	50-02871-W	N/A	N/A	N/A	15	47
	EASTLAKES PROPERTY OWNERS ASSOCIATION	50-03281-W	47	29	N/A	40	124
	EASTPOINTE PROPERTY OWNERS ASSOCIATION	50-03282-W ^{wr}	72	74	90	70	215
	THE SANCTUARY & FLAMINGO ROAD	50-03401-W	N/A	N/A	N/A	9	28
Sub Total						1243	3813

Table O-5. Water Supply Demands within the Loxahatchee Watershed (Cont.)

Palm Beach County		Permit Number	1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
PWS	TOWN OF JUPITER	50-00010-W ^{fl}	3699	3442	3214	10045	30825
	VILLAGE OF TEQUESTA	50-00046-W ^{fl}	549	589	446	1768	5427
	SEACOAST UTILITY AUTHORITY (Hood Rd.)	50-00365-W	3673	4604	4729	7049	21631
	PALM BEACH PARK OF COMMERCE	50-01528-W	N/A	N/A	N/A	65	198
Sub Total						18927	58081
Martin Co Total						8137	24970
Palm Beach Co Total						24825	76180
TOTAL			N/A	N/A	N/A	32962	101150

^{wr} Waste Water Reuse^{fl} Floridan Aquifer